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2 Application of a Nationality-Adjusted Net Sales and Value-Added Framework: The Case of Japan

Fukunari Kimura and Robert E. Baldwin

2.1 Introduction

In the companion paper for the United States (chap. 1 in this volume), we propose a nationality-adjusted net sales and value-added framework and apply it to U.S. data in order to show its usefulness in analyzing a number of current economic issues and to specify points for statistical improvement. The framework should eventually be expanded to an internationally integrated statistical system that captures all activities of multinational enterprises in the world. As a preliminary effort, this paper applies the framework to Japan.

The proposed framework analyzes the globalization of firms' activities from a new viewpoint. Traditional balance-of-payments statistics conceptually present international transactions between economic agents in different locations, a framework consistent with GDP or national accounts statistics.[1] Since the balance-of-payments format primarily follows the residency of economic agents, the value added of foreign affiliates is conceptually decomposed into a residents' portion and a nonresidents' portion, with the latter portion being

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1. The balance-of-payments framework determines the residency of individuals by whether or not they reside in a country for one year or more (in the International Monetary Fund [IMF] version of the balance-of-payments manual; in the Japanese version, more than two years for Japanese abroad and more than six months for foreigners in Japan) and that of firms by whether or not they are officially established and registered as local firms. This means that, e.g., a U.S. affiliate of a Japanese firm is treated as American. Hence, merchandise and service trade is basically captured as transactions between economic agents in different geographical locations rather than between economic agents with different nationalities.

captured as investment income (including retained earnings). Thus, the balance-of-payments framework is not very convenient for analyzing the behavior of globalized firms. Merchandise and service transactions between parent companies and affiliates may be qualitatively different from usual transactions between domestic firms and foreign firms. A firm may have its own resources for competitiveness, such as firm-specific technology and managerial ability, that can be used both inside and outside of the home country. Furthermore, even if a firm has multiple establishments across the world, it may make managerial decisions jointly. Our proposed framework assigns nationalities to firms and treats each firm as an individual entity. By doing so, we can analyze the competitiveness of firms in international markets, the importance of foreign-controlled affiliates in a national economy, firms' decisions on whether to export or to invest abroad, and other related issues. These features of firms' activities are particularly important in the case of Japan where firms' activities have globalized rapidly.

Although Japan is one of the few countries that collect extensive operational data on inward and outward direct foreign investment (DFI), we still encounter a number of problems in applying the framework. We try to identify explicitly various statistical deficiencies in the available data and relate them to the proposed statistical format. However, despite large possible estimation errors, we believe that the framework is very useful for analyzing the relationship of the Japanese economy to the world economy. Our analysis confirms the often-claimed asymmetry between the inward and outward DFI of Japan. We also find a rapid expansion of Japanese firms' activities abroad that exceeds the expansion of exports. In addition, we show that the activities of commercial affiliates of Japanese firms abroad, particularly those of general trading companies, play an important role in Japanese international transactions.

In section 2.2, the existing data for Japanese inward and outward DFI are briefly explained. Sections 2.3 and 2.4 present our estimation of aggregate and sectoral net sales by the Japanese to foreigners and the value added of foreign affiliates. Section 2.5 provides a preliminary overview of commercial affiliates of Japanese firms, which are specific to Japan and must be taken into consideration in developing an internationally integrated statistical format. Section 2.6 summarizes what is specific to Japan and discusses directions for the improvement of the statistical format.

2.2 Data on Sales and Purchases by Affiliates

A Ministry of International Trade and Industry (MITI) data set (hereinafter called "the old FAJF series") is the only currently available source for long time-series data on the sales and purchases of foreign affiliates of Japanese firms (FAJFs). The International Enterprises Section of MITI annually distributes questionnaires to parent Japanese companies that are identified by the Foreign Exchange and Foreign Trade Control Law as having foreign affiliates in

which they own more than a 10 percent share.[2] A detailed survey was initiated in 1980 and has been conducted every three years since 1983. A shortened questionnaire is used in the other years. Among the particularly useful information collected is data on purchases by FAJFs (such data are not collected in the U.S. surveys of foreign direct investment).[3] This survey, however, is so-called *shounin toukei* ("approved statistics"), and it is not legally mandatory for firms to complete the questionnaire. Therefore, the data are much less reliable than the U.S. data. A serious problem is low coverage. For example, in 1992, only 65.5 percent of the questionnaires sent to foreign affiliates were returned to MITI. Moreover, not all firms returning the questionnaire answered all of the questions. To make matters worse, MITI does not report the number of firms that answered each question. This problem is particularly serious for purchases data. In addition, not all firms that provide total sales or purchases data report by-destination disaggregation of sales or by-origin disaggregation of purchases.

The Research and Statistics Department of the Minister's Secretariat of MITI has recently begun to publish another statistical series covering FAJFs. This survey, called the Basic Survey of Business Structure and Activity (hereinafter "the new FAJF series"), collects data on FAJFs as a part of information obtained on private firms' activities in Japan. The new series is so-called *shitei toukei* ("designated statistics"), and companies have a legal obligation to return completed questionnaires. The survey was scheduled to be conducted annually from 1994. Only figures for the 1991 and 1994 financial years have been published as of 1997. Table 2.1 presents the 1991 financial year data on the activities of FAJFs from the two sources, the old and new FAJF series. The new FAJF series provides more reliable figures than the old FAJF series, but its coverage is narrower and biased toward large companies.[4]

Data on Japanese affiliates of foreign firms (JAFFs) are also reported by the International Enterprises Section of MITI. The structure of this survey is basically the same as that of the old FAJF survey. The coverage is, however, even narrower; for the 1992 financial year, for instance, only 53.7 percent of the questionnaires were returned to MITI.[5]

2. One of the problems with this list of enterprises is that there is no systematic procedure for updating the list. It therefore may include enterprises or foreign affiliates that once existed but are not in business anymore.

3. The Bureau of Economic Analysis (BEA) of the U.S. Department of Commerce tried to collect purchases data in the past, but it deleted the question from the questionnaire because it could not collect reliable figures.

4. The new FAJF series can be used to check the accuracy of the old FAJF series. For the 1991 financial year data, e.g., one may question the quality of sales and purchases data reported by the old FAJF series, which differ widely from those in the new FAJF series. MITI is currently trying to reformat the old and new FAJF series into an integrated framework.

5. Again, one of the problems is that there is no systematic procedure to update the list of JAFFs. MITI is currently trying to integrate the JAFF series and domestic establishment surveys. The Organization for Economic Cooperation and Development (OECD) is promoting this approach with a number of countries, including the United Kingdom and France.

Table 2.1 **Comparison between the Old and New FAJF Series, 1991 Financial Year**

	No. of FAJFs covered		Number of Employees		Sales by FAJFs (million yen)		By Destination Shares in Sales by FAJFs (%)					
							Local		Japan		Third Countries	
	OLD91	NEW91	OLD91	NEW91	OLD91	NEW91	OLD91	NEW91	OLD91	NEW91	OLD91	NEW91
					By Sector							
Total	8,505	2,851	1,620,829	919,294	88,737,186	67,111,539	69.8	65.5	11.8	14.2	18.4	20.3
Manufacturing	3,528	1,723	1,261,012	744,253	25,364,961	16,149,008	69.5	74.2	8.4	7.4	22.1	18.3
Food processing	157	67	33,788	9,833	493,781	214,800	53.0	62.5	25.9	23.5	21.1	13.9
Textiles	185	60	92,020	21,663	676,604	192,059	55.3	64.9	10.1	9.7	34.6	25.3
Chemicals	495	151	78,262	26,377	1,890,649	591,268	66.3	61.1	5.9	5.8	27.7	33.1
Basic metals	216	93	59,726	18,752	1,411,713	310,581	78.9	79.4	5.1	8.0	16.0	12.6
General machinery	291	162	65,687	42,072	2,367,135	1,176,577	67.2	79.5	4.4	5.7	28.4	14.9
Electrical machinery	940	530	435,796	329,712	8,107,032	5,906,542	64.0	61.2	10.9	11.2	25.0	27.6
Transport equipment	425	218	257,264	136,271	7,004,617	5,283,201	85.0	89.4	2.6	1.7	12.3	8.9
Precision machinery	139	75	28,689	25,318	405,423	361,769	48.8	54.6	19.4	24.2	31.8	21.2
Petroleum and coal products	18	3	5,644	n.a.	139,736	n.a.	61.3	n.a.	0.0	n.a.	38.7	n.a.
Other manufacturing	662	364	204,136	134,255	2,868,271	2,112,211	68.1	78.0	9.9	7.9	22.0	14.2
Commerce	2,589	1,112	238,975	171,098	58,337,017	50,811,689	69.0	62.7	14.5	16.4	16.5	20.9
Services	619	n.a.	37,588	n.a.	1,173,761	n.a.	96.1	n.a.	2.8	n.a.	1.1	n.a.
Others	1,769	17	83,254	55	3,861,447	43,620	75.4	13.8	16.9	49.7	7.7	36.5

By Location

World total	8,505	2,851	1,620,829	919,294	88,737,186	67,111,539	69.8	65.5	11.8	14.2	18.4	20.3
North America	2,399	971	444,289	272,999	40,368,155	32,957,029	84.4	77.4	10.5	12.4	5.1	10.2
United States	2,177	890	415,666	255,264	37,653,870	30,795,603	84.8	77.3	10.5	12.2	4.7	10.5
Middle and South America	584	108	105,519	52,444	2,524,748	1,218,308	59.3	47.8	24.1	28.7	16.6	23.5
Asia	3,156	949	744,520	386,110	16,702,312	11,211,411	57.5	46.9	15.2	18.7	27.3	34.4
ASEAN4	1,194	364	394,330	211,021	4,713,576	1,835,711	60.4	47.6	13.9	19.4	25.7	32.9
NIEs4	1,693	529	277,459	154,995	11,576,548	9,297,727	54.1	46.7	16.4	18.5	29.5	34.8
Middle East	51	4	9,276	n.a.	907,197	n.a.	21.5	n.a.	40.8	n.a.	37.6	n.a.
Europe	1,785	688	250,608	178,216	23,661,636	18,207,633	63.4	59.3	5.3	9.5	31.3	31.2
EC	1,615	657	240,333	175,603	22,591,507	17,952,678	66.4	59.0	5.6	9.5	28.0	31.5
Oceania	407	129	56,368	24,134	4,051,605	3,118,578	62.4	54.1	30.3	37.3	7.3	8.6
Africa	123	2	10,249	n.a.	521,533	n.a.	31.0	n.a.	31.0	n.a.	38.0	n.a.

(*continued*)

Table 2.1 (continued)

	Purchases by FAJFs (million yen)		By Origin Shares in Purchases by FAJFs (%)						Purchases/Sales Ratios (%)	
			Local		Japan		Third Countries			
	OLD91	NEW91	OLD91	NEW91	OLD91	NEW91	OLD91	NEW91	OLD91	NEW91
					By Sector					
Total	47,850,264	53,895,778	36.5	27.8	41.8	n.a.	21.7	n.a.	53.9	80.3
Manufacturing	10,380,640	10,484,599	43.6	44.6	42.4	n.a.	13.9	n.a.	40.9	64.9
Food processing	193,038	108,287	88.3	75.4	4.7	n.a.	7.0	n.a.	39.1	50.4
Textiles	173,492	105,103	44.1	50.9	20.0	n.a.	36.0	n.a.	25.6	54.7
Chemicals	482,020	266,287	62.8	52.6	23.6	n.a.	13.6	n.a.	25.5	45.0
Basic metals	725,757	201,238	51.4	60.4	17.3	n.a.	31.3	n.a.	51.4	64.8
General machinery	505,600	614,433	43.2	65.2	48.7	n.a.	8.1	n.a.	21.4	52.2
Electrical machinery	3,836,972	3,820,493	32.1	36.5	49.5	n.a.	18.5	n.a.	47.3	64.7
Transport equipment	2,910,419	3,960,656	51.2	52.2	45.4	n.a.	3.4	n.a.	41.6	75.0
Precision machinery	127,440	195,332	28.4	22.5	67.0	n.a.	4.6	n.a.	31.4	54.0
Petroleum and coal products	46,729	n.a.	58.9	n.a.	17.4	n.a.	23.7	n.a.	33.4	n.a.
Other manufacturing	1,379,173	1,212,771	61.0	31.1	21.5	n.a.	17.4	n.a.	48.1	57.4
Commerce	35,486,167	43,290,361	31.5	23.7	42.4	n.a.	26.1	n.a.	60.8	85.2
Services	441,532	n.a.	79.2	n.a.	15.6	n.a.	5.2	n.a.	37.6	n.a.
Others	1,541,928	37,282	89.0	1.3	8.7	n.a.	2.3	n.a.	39.9	85.5

					By Location					
World total	47,850,264	53,895,778	36.5	27.8	41.8	n.a.	21.7	n.a.	53.9	80.3
North America	22,215,404	27,365,443	52.7	34.4	37.2	n.a.	10.1	n.a.	55.0	83.0
United States	20,844,276	25,496,874	53.9	35.0	36.3	n.a.	9.8	n.a.	55.4	82.8
Middle and South America	1,298,949	909,132	34.6	27.2	36.3	n.a.	29.1	n.a.	51.4	74.6
Asia	9,334,981	8,665,570	33.7	24.5	39.6	n.a.	26.7	n.a.	55.9	77.3
ASEAN4	2,721,950	1,293,308	42.1	41.2	36.9	n.a.	21.0	n.a.	57.7	70.5
NIEs4	6,469,430	7,317,362	29.5	21.4	41.0	n.a.	29.5	n.a.	55.9	78.7
Middle East	605,886	n.a.	9.3	n.a.	41.2	n.a.	49.4	n.a.	66.8	n.a.
Europe	11,864,239	13,764,828	15.6	17.3	49.3	n.a.	35.1	n.a.	50.1	75.6
EC	11,039,056	13,573,922	17.0	17.3	49.3	n.a.	33.6	n.a.	48.9	75.6
Oceania	2,117,517	2,765,517	40.9	29.8	54.3	n.a.	4.8	n.a.	52.3	88.7
Africa	413,288	n.a.	78.1	n.a.	9.2	n.a.	12.8	n.a.	79.2	n.a.

Data Sources: OLD91 (57, 75, 78–101, 126); NEW91 (398–401, 450–53).

Notes: The sample set of the old FAJF series (OLD91) includes affiliates in which the Japanese have more than a 10 percent share and affiliates in which Japanese majority-owned affiliates have more than a 50 percent share, and the parent companies of which are in industries other than finance, insurance, and real estate. The new FAJF series (NEW91) covers majority-owned foreign affiliates of Japanese firms with more than U.S.$1 million of capital, in the mining, manufacturing, and commerce sectors, whose parent companies have more than 50 employees and more than 30 million yen of capital in the mining, manufacturing, and commerce sectors.

"n.a." in NEW91 means that the data are not available, which is in part the result of small sample sizes.

Sales and purchases by FAJFs obtained from NEW91 are converted from U.S. dollars to yen using IMF92 (437): U.S.$1 = 134.71 yen.

Large differences between the two series are partly due to different coverage and partly due to the data quality of the old FAJF series. One of the serious problems with the old FAJF series is that not all firms that returned the questionnaire provided figures for all questions (at least for 1991 and 1992) and MITI publicizes total figures only. What we are particularly concerned about is the quality of the calculated value-added estimates. The purchases figures are probably understated in the old FAJF series (at least for 1991 and 1992), though we could not make any adjustment because the numbers of affiliates are unknown for purchases. Lipsey, Blomström, and Ramstetter (chap. 3 in this volume) try to adjust the data for fluctuations in survey coverage using various information from other sources. We do not attempt any such adjustments.

Another difference between MITI and BEA data is that the former data set does not report sales of goods and services separately. In particular, the questionnaire by the International Enterprises Section of MITI does not explicitly specify sales and purchases as "sales and purchases of goods and services," so we are not sure if firms report service transactions. Therefore, in our estimations, we tentatively use merchandise trade (not including service trade) for cross-border trade data.

2.3 Estimation of Aggregate Net Sales

2.3.1 Defining Nationalities

MITI's old FAJF series defines "foreign affiliates of Japanese firms" as firms in which the Japanese have more than a 10 percent share and "majority-owned affiliates" as firms in which the Japanese have more than a 50 percent share. For our purposes, it is better to use data for majority-owned affiliates, but they are not available in time-series form.[6] Thus, we define FAJFs as firms in which the Japanese have more than a 10 percent share. This may cause considerable measurement error, particularly since it is a common practice for Japanese general trading companies to participate in joint ventures between Japanese and foreign companies as third parties with minor shares. For inward DFI, MITI's JAFF series defined "Japanese affiliates of foreign firms" as majority-owned affiliates until the 1990 financial year and as affiliates with more than one-third shares in the 1991 and 1992 financial years.

As in the case of the United States, we do not have data on sales and purchases by foreign citizens in Japan and those by Japanese living abroad. It is therefore necessary to classify households on a country-of-residence basis rather than on a nationality basis.

The term "Japanese" thus refers to Japanese-owned firms in Japan and abroad, households of Japanese and private foreign citizens residing in Japan (Japanese-resident households), and Japanese government units. Similarly, the term "foreigners" refers to foreign-owned firms in Japan and abroad, households of foreign and Japanese citizens residing abroad (foreign-resident households), and foreign governments.

2.3.2 Estimates of Net Sales of the Japanese to Foreigners

Table 2.2 presents estimates of the net sales of the Japanese to foreigners for 1987–92. The table consists of (I) cross-border sales to and purchases from foreigners by the Japanese, (II) sales to and purchases from foreigners by FAJFs, and (III) Japanese sales to and purchases from JAFFs.

In panel I, Japanese cross-border sales (exports) to foreigners are estimated by subtracting the sum of Japanese exports shipped to FAJFs and Japanese

6. The definition of FAJFs in the new FAJF series is "majority owned."

Table 2.2 **Net Sales by Japanese to Foreigners, 1987–92 (in millions of yen)**

Transaction	1987	1988	1989	1990	1991	1992
I. *Cross-border sales to and purchases from foreigners by Japanese*						
Exports to foreigners						
+ Japanese exports (merchandise only)	33,315,000	33,939,000	37,823,000	41,457,000	42,360,000	43,012,000
− Japanese exports shipped to FAJFs	20,571,156	24,271,567	25,067,600	24,644,049	19,364,991	14,653,484
− Japanese exports shipped by JAFFs	1,029,374	1,495,679	1,259,571	1,885,337	1,921,777	1,841,958
Total	11,714,470	8,171,754	11,495,829	14,927,614	21,073,232	26,516,558
Imports from foreigners						
+ Japanese imports (merchandise only)	21,737,000	24,006,000	28,979,000	33,855,000	31,900,000	29,527,000
− Japanese imports shipped by FAJFs	9,294,170	11,184,629	17,802,290	17,647,431	11,013,452	11,514,761
− Japanese imports shipped to JAFFs	2,820,984	3,198,105	4,122,046	5,714,953	5,381,077	4,724,046
Total	9,621,846	9,623,266	7,054,664	10,492,616	15,505,471	13,288,193
Net cross-border sales to foreigners	2,092,624	−1,451,512	4,441,165	4,434,998	5,567,761	13,228,365
II. *Sales to and purchases from foreigners by FAJFs*						
Sales by FAJFs						
+ Sales by FAJFs	54,808,975	68,426,994	93,177,600	99,806,407	88,737,186	79,007,218
− Sales to other FAJFs	3,354,457	4,795,450	6,228,815	7,800,237	6,570,591	8,455,537
− Japanese imports shipped by FAJFs	9,294,170	11,184,629	17,802,290	17,647,431	11,013,452	11,514,761
Total	42,160,348	52,446,915	69,146,495	74,358,739	71,153,143	59,036,921
Local purchases abroad by FAJFs						
+ Purchases by FAJFs	42,135,754	57,987,023	77,139,161	73,880,197	47,850,264	39,660,435
− Purchases from other FAJFs	3,354,457	4,795,450	6,228,815	7,800,237	6,570,591	8,455,537
− Japanese exports shipped to FAJFs	20,571,156	24,271,567	25,067,600	24,644,049	19,364,991	14,653,484
Total	18,210,141	28,920,006	45,842,746	41,435,911	21,914,682	16,551,414
Net sales to foreigners by FAJFs	23,950,207	23,526,909	23,303,749	32,922,828	49,238,461	42,485,506

(*continued*)

Table 2.2 (continued)

Transaction	1987	1988	1989	1990	1991	1992
III. *Japanese sales to and purchases from JAFFs*						
Japanese sales to JAFFs						
+ Purchases by JAFFs	6,284,978	7,665,564	9,247,364	12,032,837	12,060,981	11,275,793
− Sales among JAFFs	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
− Japanese imports shipped to JAFFs	2,820,984	3,198,105	4,122,046	5,714,953	5,381,077	4,724,046
Total	3,463,994	4,467,459	5,125,318	6,317,884	6,679,904	6,551,747
Japanese purchases from JAFFs						
+ Sales by JAFFs	10,420,519	12,292,986	14,003,962	16,810,563	17,792,870	16,300,170
− Sales among JAFFs	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
− Japanese exports shipped by JAFFs	1,029,374	1,495,679	1,259,571	1,885,337	1,921,777	1,841,958
Total	9,391,145	10,797,307	12,744,391	14,925,226	15,871,093	14,458,212
Net sales to JAFFs	−5,927,151	−6,329,848	−7,619,073	−8,607,342	−9,191,189	−7,906,465
IV. *Net sales by Japanese to foreigners*[a]	20,115,680	15,745,549	20,125,841	28,750,484	45,615,033	47,807,406
	(139,074)	(122,868)	(145,882)	(198,567)	(338,617)	(377,477)
Reference						
Cross-border merchandise trade balance[a]	11,578,000	9,933,000	8,844,000	7,602,000	10,460,000	13,485,000
	(80,047)	(77,511)	(64,106)	(52,504)	(77,648)	(106,475)
Exchange rates (rf; yen per dollar)	144.64	128.15	137.96	144.79	134.71	126.65

Estimation Procedure and Data Sources: In the following figures in parentheses are for 1987, 1988, 1989, 1990, 1991, and 1992, respectively; they are expressed in millions of yen (except exchange rates).

Japanese exports: Merchandise exports only. JSY90 (338), 92 (338), 95 (417): (33,315,000; 33,939,000; 37,823,000; 41,457,000; 42,360,000; 43,012,000).

Japanese exports shipped to FAJFs: One of the shortfalls of the old FAJF series is that firms in the sample report total purchases but many of them fail to report the by-origin disaggregation. E.g., out of total purchases in 1987 (42,135,754), only 38.4 percent (16,189,035) are disaggregated into local purchases (5,880,385), purchases from Japan (7,721,739), and purchases from third countries (2,586,911). We therefore estimate Japanese exports shipped to FAJFs as the sum of sectoral estimates, each of which is derived by multiplying total purchases of the sector by the share of purchases from Japan of the sector (calculated from the limited sample). OLD87/88 (94–95, 202–3), 89 (222–23), 90 (104–5), 91 (100–101), 92 (210–11): (20,571,156; 24,271,567; 25,067,600; 24,644,049; 19,364,991; 14,653,484).

Japanese exports shipped by JAFFs: AF87/88 (71, 225), 89 (73), 90 (77), 91 (75), 92 (79): (1,029,374; 1,495,679; 1,259,571; 1,885,337; 1,921,777; 1,841,958).

Japanese imports: Merchandise imports only. JSY90 (338), 92 (338), 95 (417): (21,737,000; 24,006,000; 28,979,000; 33,855,000; 31,900,000; 29,527,000).

Japanese imports shipped by FAJFs: As in Japanese exports shipped to FAJFs, firms in the sample report total sales but many of them fail to report the by-destination disaggregation. E.g., out of total sales in 1987 (54,808,975), only 42.2 percent (23,144,497) are disaggregated into local sales (15,388,102), sales to Japan (3,770,459), and sales to third countries (3,985,936). We therefore estimate Japanese imports shipped by FAJFs as the sum of sectoral estimates, each of which is derived by multiplying total sales of the sector by the share of sales to Japan of the sector (calculated from the limited sample). OLD87/88 (82–83, 190–91), 89 (210–11), 90 (88–89), 91 (88–89), 92 (198–99): (9,294,170; 11,184,629; 17,802,290; 17,647,431; 11,013,452; 11,514,761).

Japanese imports shipped to JAFFs: AF87/88 (105, 239), 89 (107), 90 (111), 91 (109), 92 (113): (2,820,984; 3,198,105; 4,122,046; 5,714,953; 5,381,077; 4,724,046).

Sales by FAJFs: OLD87/88 (83, 191), 89 (211), 90 (89), 91 (89), 92 (199): (54,808,975; 68,426,994; 93,177,600; 99,806,407; 88,737,186; 79,007,218).

Sales to other FAJFs: Although data on sales among FAJFs are not available, intrafirm transactions between affiliates can be estimated. For 1989, using the same method as in estimating Japanese imports from FAJFs, we first estimate local sales and sales to third countries of each sector. Then, by multiplying ratios of intragroup sales in local sales and sales to third countries of each sector, we can estimate the intrafirm trade of the sector. The sum of sectoral estimates provides a proxy of sales to other FAJFs. For 1987, 1988, 1990, and 1991, ratios of intragroup sales in 1989 are used. OLD87/88 (82–83, 190–91), 89 (210–11, 229), 90 (88–89), 91 (88–89), 92 (198–99, 217): (3,354,457; 4,795,450; 6,228,815; 7,800,237; 6,570,591; 8,455,537).

Purchases by FAJFs: OLD87/88 (95, 203), 89 (223), 90 (105), 91 (101), 92 (211): (42,135,754; 57,987,023; 77,139,161; 73,880,197; 47,850,264; 39,660,435).

Purchases from other FAJFs: Data on purchases among FAJFs are not available. As a proxy, we use sales to other FAJFs estimated above.

Purchases by JAFFs: AF87/88 (105, 239), 89 (107), 90 (111), 91 (109), 92 (113): (6,284,978; 7,665,564; 9,247,364; 12,032,837; 12,060,981; 11,275,793).

Sales among JAFFs: Not available.

Sales by JAFFs: AF87/88 (71,225), 89 (73), 90 (77), 91 (75), 92 (79): (10,420,519; 12,292,986; 14,003,962; 16,810,563; 17,792,870; 16,300,170).

Exchange rates: Yen per dollar (rf series). IMF92 (437), 94 (316): (144.64; 128.15; 137.96; 144.79; 134.71; 126.65).

Notes: FAJFs: Foreign affiliates of Japanese firms abroad, which include affiliates in which the Japanese have more than a 10 percent share and affiliates in which Japanese majority-owned affiliates have more than a 50 percent share. Only the parent firm with the largest share reports the figures. Only affiliates whose parent companies are in industries other than finance, insurance, and real estate are covered. Coverage of affiliate data (in terms of number of affiliates) for 1987–92 is 79.4, 78.8, 72.3, 78.2, 78.5, and 65.5 percent.

JAFFs: Majority-owned (with more than a one-third share from 1991 fiscal year) Japanese affiliates of foreign firms in Japan, which report their direct investment to MITI and have foreign participation in management. Coverage of affiliate data (in terms of number of affiliates) for 1987–92 is 50.1, 52.3, 51.8, 51.8, 51.9 and, 53.7 percent.

Years: Japanese exports and imports are on a calendar-year basis, while data for FAJFs and JAFFs are on a financial-year basis.

[a]Figures in parentheses are in millions of dollars.

exports shipped by JAFFs from cross-border exports of Japan valued on an f.o.b. basis. The estimate of such cross-border sales (exports) in 1987, for example, is 11,714 billion yen, which is much smaller than Japan's cross-border exports of 33,315 billion yen.

Quite aside from the above-mentioned coverage problem, the 11,714 billion yen figure is, for several reasons, still only an approximation. The most serious problem is that the figure for Japanese exports shipped to FAJFs (20,571 billion yen) is a very rough estimate. Among FAJFs reporting the total amount of purchases are many that do not provide figures for purchases disaggregated by origin; that is, a considerable portion of FAJFs do not report separately local purchases, purchases from Japan, and purchases from third countries. In 1987, for example, only 38.4 percent of total purchases by FAJFs can be disaggregated by origin. We, hence, first calculate the ratio of purchases from Japan to total purchases for firms in each sector reporting purchases by origin. Then we multiply that ratio by total purchases by all firms in the sector and sum up all sectors' estimates of purchases from Japan. Another potential estimation problem concerns the treatment of purchases by FAJFs from commercial FAJFs. When an FAJF in the commercial sector imports intermediate goods and sells them to a noncommercial FAJF, both the commercial and noncommercial FAJFs may treat these purchases as purchases from abroad. This means that the purchases ratios from Japan (and those from third countries) may be overstated to some extent. The estimation of purchases by FAJFs from Japan or Japanese exports shipped to FAJFs (20,571 billion yen) in 1987 may therefore differ from the true figure. In addition, exports by JAFFs to FAJFs are subtracted twice in this calculation since they are included in both Japanese exports shipped to FAJFs and Japanese exports shipped by JAFFs. This, however, probably does not affect our estimates very much.[7]

The lower half of panel I of table 2.2 shows our estimates of Japanese cross-border purchases (imports) from foreigners, namely, 9,622 billion yen in 1987. These are again much smaller than cross-border imports (21,737 billion yen). They are calculated by subtracting the sum of Japanese imports shipped by FAJFs and Japanese imports shipped to JAFFs from Japanese cross-border imports valued on a c.i.f. basis. Again, the estimates of Japanese imports shipped by FAJFs or sales to Japan by FAJFs (9,294 billion yen) may contain large errors. Since a large portion of FAJFs do not report by-destination disaggregation of their sales (to the local market, to Japan, and to third countries), sales by FAJFs to Japan are estimated by calculating the ratio of sales to Japan to total sales for each industrial sector, multiplying this ratio by total sales of the

7. Possible errors listed in this paragraph do not affect our estimation of Japanese net sales to foreigners shown in panel IV of table 2.2. As Lois Steckler of the Board of Governors points out in personal correspondence, Japanese net sales to foreigners are conceptually equivalent to cross-border net exports plus FAJF value added (sales minus purchases) minus JAFF value added (sales minus purchases). The possible error terms cancel out in the calculation of Japanese net sales to foreigners.

sector, and summing up all sectors' estimates of sales to Japan. Again, the ratios of sales to Japan to total sales may be overstated due to double counting in the transactions through commercial FAJFs. In addition, Japanese imports from FAJFs shipped to JAFFs are subtracted twice.[8]

By subtracting 9,622 billion yen from 11,714 billion yen, we obtain Japanese net cross-border sales to foreigners, 2,093 billion yen in 1987. Our estimates are considerably smaller than the cross-border trade balance, except in 1992.

Panel II of table 2.2 presents estimates of sales and purchases by FAJFs to and from foreigners. To obtain sales by FAJFs to foreigners (42,160 billion yen in 1987), we subtract from their total sales both sales among themselves and their sales to Japan. Data on sales among FAJFs are not available. However, intragroup sales of FAJFs to local markets and third countries, which are a part of sales among FAJFs, can be estimated. The old FAJF series for the years 1989 and 1992 gives shares of intragroup sales of FAJFs (to local markets, to Japan, and to third countries) to total sales of FAJFs for each sector. By multiplying each sector's total sales by these shares and adding them across sectors, we obtain proxies for sales among FAJFs. Since these shares are available only for 1989 and 1992, the 1989 shares are used for 1987–88 and 1990–91. The other term to be subtracted, Japanese imports shipped by FAJFs, may contain a large error, as discussed above.

Purchases by FAJFs from foreigners abroad (18,210 billion yen in 1987) are calculated by subtracting from their total purchases both purchases from other FAJFs and Japanese exports shipped to FAJFs. Data on purchases by FAJFs are directly available, which is an advantage the Japanese statistics have compared with U.S. BEA statistics. The next term, purchases from other FAJFs by FAJFs, is not directly available. We use intragroup sales of FAJFs to local and third countries, estimated above, as a proxy.[9] The other terms to be subtracted, Japanese exports shipped to FAJFs, may contain large estimation errors for the above-mentioned reasons. Our estimation of net sales by FAJFs to foreigners is 23,950 billion yen for 1987.

Panel III of table 2.2 presents the estimates of net sales of Japanese to JAFFs, which were −5,927 billion yen in 1987. Again, the JAFF series published by MITI directly provide data on purchases by JAFFs. Sales among JAFFs, however, are not available. We thus calculate Japanese sales to JAFFs (3,464 billion yen in 1987) by subtracting Japanese imports shipped to JAFFs from total purchases by JAFFs. Japanese purchases from JAFFs (9,391 billion yen in 1987) are obtained by subtracting Japanese exports shipped by JAFFs from total sales by JAFFs.

By summing up these three components, we obtain estimates of net sales to foreigners by the Japanese, for example, 20,116 billion yen in 1987 (panel IV).

8. These possible errors do not affect our estimation of Japanese net sales to foreigners.

9. Intragroup purchases from local and third countries can be estimated in a symmetric manner. However, the estimates differ from intragroup sales to local and third countries, though these must be equivalent in principle.

Despite the possible differences from the true figures, our nationality-based account characterizes various key feature of the Japanese economy. First, the asymmetry between FAJFs and JAFFs is apparent. As often pointed out (see, e.g., Lawrence 1993; Bergsten and Noland 1993, 79–82), the activities of JAFFs are much smaller than those of FAJFs. Second, net sales by the Japanese to foreigners are consistently larger than cross-border net sales (exports). This, of course, is due to the greater activity of FAJFs compared with JAFFs. According to our estimates, nationality-adjusted net sales grew at a considerably faster pace than cross-border net sales between 1988 and 1992.[10] The strong yen, the saving-investment balance, the "bubble economy," the competitive edge vis-à-vis the exchange rate, and fear of foreign protectionism seem to have accelerated Japanese outward DFI. Third, compared with the United States, the proportion of cross-border transactions through foreign affiliates is large. Based on our estimates for 1987, U.S. exports and imports through foreign affiliates of U.S. firms (FAUSFs) were 25.1 and 15.2 percent of total U.S. exports and imports, while Japanese exports and imports through FAJFs were 61.7 and 42.8 percent of total Japanese exports and imports. Although the ratio on the export side for Japan declined sharply to 34.1 percent in 1992, both ratios were still higher than those for the United States.[11] As we mentioned, our estimates of by-destination sales and by-origin purchases of FAJFs could contain large errors, but we can still infer that Japan depends on its foreign affiliates in export and import transactions much more extensively than the United States does. Activities by FAJFs in the commercial sector are particularly important. According to our estimates, Japanese exports and imports through commercial FAJFs amounted to 48.2 and 36.0 percent of total Japanese exports and imports in 1987. We discuss commercial FAJFs further in section 2.5.

2.3.3 Estimates of Value Added by FAJFs and JAFFs

The same data set that we used in constructing table 2.2 can also be used to estimate value added by FAJFs and JAFFs. Since the old FAJF and JAFF series published by MITI directly report total sales and purchases by FAJFs and JAFFs, value added can be calculated by simply subtracting total purchases from total sales. Strictly speaking, we need to take into consideration such factors as depreciation, indirect taxes, and changes in inventory stock, but data on these variables are not available. Table 2.3 presents our estimates. The format of the table follows that used in our companion paper for the United States.

10. The estimate of nationality-adjusted sales for 1988 is particularly small, while those for 1991 and 1992 look very large. This fluctuation is mainly due to changes in the value added by FAJFs, which may contain large estimation errors. We, however, can at least conclude that the activities of JAFFs expanded until 1990.

11. The decline in the estimated ratio on the export side for 1992 may be due to the understatement of purchases by FAJFs.

Table 2.3 also reports ratios of value added by FAJFs to value added by all Japanese-owned firms, the latter being defined as Japanese GDP plus value added by FAJFs minus value added by JAFFs, and ratios of value added by JAFFs to the GDP of Japan.[12] The ratio of value added by FAJFs to value added by all Japanese-owned firms increased during the period, but the figures of 8.33 and 7.87 percent for 1991 and 1992 may be overstated due to a purchases figure that is unusually low compared with the corresponding sales figure.[13] We can, however, conclude that Japanese firms have increased the extent of production abroad and have reached roughly the same degree of internationalization of activities as U.S. firms have. As reported in our companion paper, the ratio of value added by FAUSFs to that of U.S.-owned firms ranges from 5 to 6 percent. The ratio of value added by JAFFs to Japanese GDP, in contrast, is generally only a little larger than 1 percent. The asymmetry between the behavior of FAJFs and JAFFs is obvious.

The proportion of foreign activities by Japanese firms is often measured by the foreign production ratio, which is defined as the ratio of the value of production of FAJFs to total domestic production. The figure for the manufacturing sector in the 1993 fiscal year, for example, is estimated as 6.4 percent by MITI (1994d, 46). The value of production, however, includes the value of intermediate inputs and thus is not appropriate for measuring the size of economic activities in Japan and abroad. Our value-added method is conceptually better for indicating the proportion of foreign activities of Japanese firms, although it may contain considerable measurement error due to the quality of data.

2.3.4 Comparison of Exports and Direct Foreign Investment on a Value-Added Basis

In other empirical studies, firms' choices between exports and DFI are usually captured by comparing basically incomparable figures, namely, exports and DFI flows. Our value-added method makes it possible to compare directly two ways in which firms can sell their products to foreigners abroad: by producing domestically and exporting and by producing abroad and selling there.

Following the companion paper for the United States, we calculate Japanese value-added figures in exports of Japanese-owned firms. They are useful in comparing the proportion of Japanese firms' sales activities to foreigners through cross-border transactions and through the activities of FAJFs. To obtain the estimates, we subtract exports by JAFFs from total cross-border ex-

12. Value added by Japanese-owned firms as well as Japanese GDP includes production that takes place outside firms, such as in the government and household sectors.

13. As mentioned in the note to table 2.1, the 1991 data on sales and purchases provided by the new FAJF series suggest much smaller value added by FAJFs. The ratios of value added by FAJFs to sales under the old FAJF series in table 2.3 also look too large for 1991 and 1992. This discrepancy may be due to the small number of FAJFs providing purchases figures, though this cannot be proved from published documents.

Table 2.3 Value Added by FAJF and JAFF, 1987–92 (in millions of yen)

Transaction	1987	1988	1989	1990	1991	1992
I. *Value added by FAJFs*						
+ Sales by FAJFs	54,808,975	68,426,994	93,177,600	99,806,407	88,737,186	79,007,218
− Local purchases abroad by FAJFs	18,210,141	28,920,006	45,842,746	41,435,911	21,914,682	16,551,414
− Japanese exports shipped to FAJFs	20,571,156	24,271,567	25,067,600	24,644,049	19,364,991	14,653,484
− Purchases from other FAJFs	3,354,457	4,795,450	6,228,815	7,800,237	6,570,591	8,455,537
Total	12,673,221	10,439,971	16,038,439	25,926,210	40,886,922	39,346,783
In goods and services sold to						
Japanese	2,924,682	2,438,096	4,136,417	6,610,413	8,102,098	9,945,509
Foreigners	9,748,539	8,001,875	11,902,022	19,315,797	32,784,824	29,401,274
Received by						
Japanese	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Foreigners	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Value added/sales ratio (%)	23.12	15.26	17.21	25.98	46.08	49.80
II. *Japanese value added in exports of Japanese-owned firms*[a]	28,940,835	29,082,193	32,775,458	35,472,039	36,904,826	36,248,823
In export to FAJFs	18,439,984	21,757,033	22,470,597	22,090,926	17,672,923	12,901,895
In exports to foreigners	10,500,851	7,325,160	10,304,861	13,381,113	19,231,902	23,346,928
III. *Value added by JAFFs*						
+ Sales by JAFFs	10,420,519	12,292,986	14,003,962	16,810,563	17,792,870	16,300,170
− Purchases within Japan by JAFFs	3,463,994	4,467,459	5,125,318	6,317,884	6,679,904	6,551,747
− Japanese imports shipped to JAFFs	2,820,984	3,198,105	4,122,046	5,714,953	5,381,077	4,724,046
− Purchases from other JAFFs	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total	4,135,541	4,627,422	4,756,598	4,777,726	5,731,889	5,024,377

In goods and services sold to						
Japanese	3,727,018	4,064,407	5,328,771	4,241,895	5,112,798	4,456,610
Foreigners	408,523	563,015	427,827	535,831	619,091	567,767
Received by						
Japanese	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Foreigners	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Value added/sales ratio (%)	39.69	37.64	33.97	28.42	32.21	30.82
IV. *Value added in exporting country by foreign-owned firms*[a]	11,153,753	11,493,077	10,018,803	14,528,465	18,722,702	16,146,171
In exports to Japanese	8,625,023	8,626,296	6,323,801	9,405,581	13,899,104	11,911,536
In exports to JAFFs	2,528,730	2,866,781	3,695,002	5,122,884	4,823,597	4,234,635
Reference						
GDP of Japan	353,989,000	376,889,000	402,311,000	432,862,000	455,862,000	465,431,000
Ratio of value added of FAJFs to that of Japanese-owned firms (%)	3.50	2.73	3.88	5.71	8.33	7.87
Ratio of value added to JAFFs to Japanese GDP (%)	1.17	1.23	1.18	1.10	1.26	1.08

Data Sources: GDP of Japan: JSY92 (555), 95 (142). See estimation procedure and data source note to table 2.2 for other data.

Notes: Value added of Japanese-owned firms = GDP of Japan + value added of FAJFs − value added of JAFFs.
All data are on a financial-year (April–March) basis.

[a]Figures in panels II and IV are estimated using the import inducement coefficient of export (10.36 percent) obtained from IO90 (321, 388). See the text for details.

ports and then subtract the import component in the remaining exports.[14] In Japan, input-output tables are presented in the non-competitive-import form and hence directly provide the import inducement coefficient of exports or the direct and indirect import content of exports. This was 10.36 percent in 1990. By using this figure for 1987–92, Japanese value added in exports of Japanese-owned firms can be calculated. This amounted to 28,941 billion yen in 1987, for example. Out of the 28,941 billion yen, 10,501 billion yen was the value added in exports by Japanese firms located in Japan to foreigners abroad. This figure is directly comparable with the 9,749 billion yen of value added in the goods and services sold by FAJFs to foreigners. There are two ways for Japanese firms to sell their products to foreigners: by producing in Japan and exporting and by producing abroad and selling there. The comparison between 10,501 billion yen and 9,749 billion yen provides a clear idea of the relative importance of these two marketing methods. Compared with the same figures for the United States reported in Baldwin and Kimura (chap. 1), transactions by Japanese foreign affiliates are more important, mainly because the ratio of exports by FAJFs to total exports is large. Even after discounting the large estimates of value added by FAJFs in 1991 and 1992, transactions by FAJFs seem to be becoming more important over time.

Value added in exporting countries by foreign-owned firms is estimated in a similar way. Because input-output tables for the rest of the world are not available, the figure for Japan, 10.36 percent, is tentatively used. The estimate of value added in exporting countries by foreign-owned firms abroad is 11,154 billion yen in 1987. Out of this, value added in foreign exports to the Japanese in Japan is 8,625 billion yen. This figure can be directly compared with 3,727 billion yen, which is the value added in goods and services sold by JAFFs to the Japanese in Japan. The importance of transactions through JAFFs seems to be declining over time.

2.4 Estimation of Sectoral Net Sales

2.4.1 Sectoral Net Sales

In this section, we estimate nationality-based net sales by individual industrial sectors. We believe that they provide a better idea of firms' international competitiveness determined by technological know-how and managerial ability than cross-border net exports do.

A problem arising in sectoral matching of DFI figures and trade statistics is that affiliate data are classified by industry while cross-border trade data are classified by commodity. This difference leads to a serious problem, particu-

14. Precisely speaking, we must consider the JAFF component in these exports to avoid double counting, but the data are not available.

larly in the treatment of the commercial sector. We therefore estimate net sales only for the manufacturing sector.

Nationality-adjusted sales for individual sectors are calculated as follows:

Nationality-adjusted sales = Japan's cross-border exports
+ sales by FAJFs + purchases by JAFFs
− Japan's exports shipped to FAJFs
− Japan's imports shipped by FAJFs
− sales to other FAJFs by FAJFs
− Japan's exports shipped by JAFFs
− Japan's imports shipped to JAFFs.

On the other hand, nationality-adjusted purchases for individual sectors are defined as follows:

Nationality-adjusted purchases = Japan's cross-border imports
+ sales by JAFFs + purchases by FAJFs
− Japan's exports shipped to FAJFs
− Japan's imports shipped by FAJFs
− purchases from other FAJFs by FAJFs
− Japan's exports shipped by JAFFs
− Japan's imports shipped to JAFFs.

Nationality-adjusted net sales are calculated by subtracting nationality-adjusted purchases from nationality-adjusted sales. We assume that each industry purchases intermediate inputs only from its own industry, since data on sectoral purchases by industrial origin are not available. This is, of course, a strong assumption, but it should roughly hold for the manufacturing sector. Nationality-adjusted net sales of an individual industrial sector then become equivalent to cross-border net sales (exports) plus value added by FAJFs minus value added by JAFFs for the sector. By following this estimation procedure, possible estimation errors in by-destination sales and by-origin purchases by FAJFs and JAFFs cancel out in the calculation.[15]

Table 2.4 presents cross-border net sales, nationality-adjusted net sales, and their ratios to the corresponding total sales (of all firms in Japan or of all Japanese-owned firms). To be consistent with the macroeconomic figures, we

15. The sector matching list between our industry (commodity) classification and SITC Revision 2 is available upon request.

Table 2.4 **Cross-Border and Nationality-Adjusted Net Sales by Sector**

	Cross-Border Net Sales[a]						Nationality-Adjusted Net Sales[a]					
Sector	1987	1988	1989	1990	1991	1992	1987	1988	1989	1990	1991	1992
Total	11,528,693	9,939,713	8,874,690	7,550,636	10,478,920	13,504,594	20,066,373	15,752,262	20,156,531	28,699,120	45,633,953	47,827,000
Manufacturing	21,297,715	19,675,032	20,204,591	20,925,081	22,848,678	24,918,951	21,589,169	21,055,289	23,208,815	28,484,365	33,803,547	36,509,672
Food processing	−1,101,196	−1,310,955	−1,584,472	−1,707,678	−1,752,546	−1,826,175	−1,085,176	−1,269,383	−1,542,527	−1,573,097	−1,656,842	−1,647,090
Textiles	−324,978	−718,266	−1,133,064	−1,058,343	−1,017,400	−1,099,777	−214,835	−538,177	−993,237	−607,435	−541,197	−760,918
Chemicals	−296,351	−375,906	−391,840	−333,545	−336,878	−196,899	−704,518	−796,094	−941,477	−393,287	−258,662	94,310
Basic metals	905,759	455,336	281,819	62,211	115,725	637,167	1,380,705	948,252	616,772	600,633	473,811	1,365,507
General machinery	6,270,341	6,767,426	7,705,274	8,051,638	8,379,562	8,813,466	6,209,419	6,948,108	8,000,782	9,344,367	10,164,196	9,161,093
Electrical machinery	6,114,123	6,393,681	6,880,890	7,282,399	7,477,108	7,424,773	6,489,225	7,219,511	7,218,124	9,788,039	10,709,812	10,186,766
Transport equipment	8,576,168	7,640,115	8,223,757	8,784,646	9,085,143	9,731,532	9,071,394	8,349,570	9,760,246	10,850,617	13,139,792	15,183,381
Precision machinery	1,261,682	1,260,404	1,347,500	1,411,273	1,470,442	1,428,276	1,302,296	1,450,029	1,516,363	1,398,055	1,625,172	1,383,764
Petroleum and coal products	−1,059,410	−982,160	−1,228,198	−1,444,532	−1,011,156	−741,460	−2,187,322	−2,211,888	−1,717,838	−1,941,294	−1,630,928	−746,129
Other manufacturing	951,576	545,357	102,925	−122,988	438,679	748,050	1,327,980	955,361	1,291,607	1,017,767	1,778,394	2,288,990
Others	−9,769,022	−9,735,318	−11,329,901	−13,374,444	−12,369,758	−11,414,357	−1,522,796	−5,303,026	−3,052,284	214,756	11,830,403	11,317,328

Sector	Cross-Border Net Sales/Total Sales[b]						Nationality-Adjusted Net Sales/Total Sales[b]					
	1987	1988	1989	1990	1991	1992	1987	1988	1989	1990	1991	1992
Total	1.79	1.44	1.18	0.92	1.22	1.57	2.91	2.10	2.42	3.19	4.90	5.19
Manufacturing	7.75	6.63	6.27	6.01	6.24	7.09	7.70	6.88	6.92	7.83	8.88	9.96
Food processing	−3.39	−3.93	−4.61	−4.74	−4.66	−4.74	−3.33	−3.77	−4.44	−4.33	−4.39	−4.24
Textiles	−4.50	−9.66	−15.10	−14.00	−13.48	−15.15	−2.82	−6.75	−12.69	−7.37	−6.63	−9.83
Chemicals	−1.35	−1.62	−1.56	−1.25	−1.22	−0.71	−3.28	−3.51	−3.90	−1.50	−0.97	0.35
Basic metals	3.04	1.37	0.78	0.16	0.30	1.90	4.49	2.76	1.65	1.52	1.19	3.93
General machinery	22.04	20.59	20.70	19.08	18.35	20.91	21.75	20.76	21.13	20.85	21.40	21.29
Electrical machinery	15.29	14.35	14.16	13.99	13.32	14.33	15.04	14.73	13.57	17.01	17.27	17.93
Transport equipment	25.38	21.43	20.54	20.00	19.72	20.58	24.65	21.33	20.80	21.36	24.81	27.13
Precision machinery	32.17	29.81	29.44	28.40	27.64	29.80	32.55	28.41	31.23	29.81	29.96	29.35
Petroleum and coal products	−10.40	−9.90	−11.37	−11.42	−7.83	−5.99	−28.92	−29.87	−21.40	−21.24	−17.05	−7.67
Other manufacturing	1.42	0.76	0.13	−0.15	0.50	0.87	1.95	1.30	1.61	1.18	1.96	2.60
Others	−4.70	−4.37	−4.65	−5.12	−4.54	−4.11	−0.37	−1.20	−0.61	0.04	2.15	2.04

Data Sources: OLD87/88, 89. 90, 91, 92; AF87/88, 89, 90, 91, 92; EPA94; IMF92; UN90, 92.

Notes: Cross-border net sales / total sales = ratio of cross-border net exports to sales by all firms in Japan.

Nationality-adjused net sales / total sales = ratio of nationality-adjusted net sales to sales by Japanese-owned firms (all firms in Japan + FAJFs − JAFFs).

The old FAJF and JAFF series are on a financial-year basis, while the others are on a calendar-year basis.

[a]In millions of yen.

[b]Percentage.

use sectoral data on the value of output (in producer prices) obtained from the national accounts statistics as a proxy for the total sales of all firms in Japan.[16] The figures for aggregate cross-border net sales are slightly different from those for the cross-border merchandise trade balance shown in table 2.2 because the former are based on UN data reported in U.S. dollars while the latter are from the *Japan Statistical Yearbook* reported in yen. The other data are taken directly from the FAJF and JAFF series published by MITI.

For the manufacturing sector as a whole, net sales figures, both cross-border and nationality-adjusted, are positive as expected. However, whereas the ratios of nationality-adjusted net sales to total sales have increased since 1989, those of cross-border sales have not changed much. This suggests that the international competitiveness of Japanese manufacturing firms has increased, while that of firms in territorial Japan has not. We again have to note reservations about the 1991–92 figures, however. As for sectoral patterns, large positive net sales, both cross-border and nationality-adjusted, are found in general machinery, electrical machinery, transport equipment, and precision machinery, and negative net sales are shown for food processing, textiles, chemicals (except nationality-adjusted net sales in 1992), and petroleum and coal products. The ratios of nationality-adjusted net sales to total sales sometimes exhibit significant sudden changes, for example, textiles in 1989 and petroleum and coal products in 1992, even though the ratios of cross-border net sales to total sales do not change appreciably. Such jumps are mainly caused by drastic increases in sectoral value added by FAJFs.

2.4.2 Sectoral Significance of FAJFs and JAFFs

The macroeconomic significance of the activities of FAJFs and JAFFs has already been discussed. The sectoral significance of the activities of FAJFs and JAFFs can be evaluated by using sectoral data on output, value added, and employment in the Japanese national accounts statistics. Table 2.5 presents shares of FAJFs in Japanese-owned firms (firms in Japan minus JAFFs plus FAJFs) and shares of JAFFs in firms in Japan in terms of sales, value added, and employment.

Although there are some irregular up and downs partly due to the sampling problem, the figures still provide useful information for analyzing differences in the relative importance of FAJFs and JAFFs across manufacturing subsectors and across time. The value-added shares are particularly useful for comparative purposes. The major findings are as follows: first, the value-added share of FAJFs in Japanese-owned firms for the total manufacturing sector increased from 3.76 percent in 1987, to 8.57 percent in 1990, and then to 10.76 percent by 1992. The importance of the activities of foreign affiliates for

16. Alternatively, we can use sales data from "Financial Statements of Corporations by Industry" by the Ministry of Finance or value of shipments data from the "Census of Manufactures" collected by MITI, though the figures differ widely mainly due to the difference in coverage and the definition of firms or establishments.

Table 2.5 **Sales, Value Added, and Employment Shares of FAJFs and JAFFs (percent)**

	Share of FAJFs in Japanese-Owned Firms						Share of JAFFs in Firms in Japan					
	1987	1988	1989	1990	1991	1992	1987	1988	1989	1990	1991	1992
	Sales											
Total	7.39	8.52	10.47	10.40	8.91	7.99	1.50	1.65	1.73	1.92	1.92	1.76
Manufacturing	4.66	5.76	6.64	7.21	6.66	6.85	2.68	2.76	2.86	3.08	2.90	2.88
Food processing	0.84	1.35	1.49	1.37	1.31	1.43	0.64	0.61	0.56	0.57	0.81	0.56
Textiles	5.37	6.90	4.32	8.63	8.29	6.53	0.18	0.12	0.18	0.34	0.86	0.37
Chemicals	4.53	5.30	5.37	6.93	7.07	6.26	6.40	7.76	9.28	8.87	10.28	8.87
Basic metals	3.55	4.29	4.23	4.05	3.55	4.46	0.25	0.92	0.84	0.87	0.99	1.21
General machinery	3.03	3.30	2.95	7.10	4.98	2.86	2.70	1.55	1.25	1.38	1.20	0.83
Electrical machinery	10.97	13.07	12.74	13.83	13.07	12.88	3.96	4.36	4.47	4.72	4.00	4.44
Transport equipment	8.72	9.66	15.40	13.74	13.23	15.97	0.59	0.80	0.86	0.25	0.26	0.55
Precision machinery	5.22	20.78	9.23	9.05	7.47	6.42	3.31	4.37	3.68	14.15	5.65	7.93
Petroleum and coal products	0.96	0.22	0.16	0.26	1.46	6.57	26.46	25.53	25.80	27.93	27.01	26.53
Other manufacturing	1.80	2.15	3.68	3.48	3.16	2.71	0.42	0.57	0.57	0.46	0.37	0.53
Commerce	37.22	40.57	47.21	46.59	41.07	36.02	4.15	5.13	5.80	6.64	7.29	6.13
Services	0.28	0.40	0.44	0.70	0.88	0.88	0.04	0.07	0.04	0.09	0.31	0.26
Others	0.62	0.82	1.44	1.11	1.14	1.12	0.05	0.08	0.06	0.11	0.05	0.04

(*continued*)

Table 2.5 (continued)

	Share of FAJFs in Japanese-Owned Firms						Share of JAFFs in Firms in Japan					
	1987	1988	1989	1990	1991	1992	1987	1988	1989	1990	1991	1992
	Value Added											
Total	3.54	2.75	3.92	5.79	8.40	7.94	1.18	1.24	1.19	1.12	1.27	1.09
Manufacturing	3.76	4.70	5.84	8.57	10.53	10.76	3.48	3.47	3.37	2.98	3.07	2.77
Food processing	0.99	1.32	1.31	1.98	2.14	2.10	0.86	0.99	0.98	1.00	1.47	0.91
Textiles	4.30	6.61	6.06	16.54	17.54	12.08	0.07	0.04	0.31	0.60	1.12	0.47
Chemicals	3.51	4.46	5.39	9.64	13.57	11.18	8.21	8.97	10.65	10.18	12.91	8.74
Basic metals	6.33	6.44	4.63	7.55	6.63	10.47	0.44	1.24	1.31	2.38	3.28	3.37
General machinery	2.21	2.21	2.78	8.08	9.75	3.19	2.77	0.79	0.72	0.61	0.44	1.08
Electrical machinery	8.84	10.96	11.05	17.25	18.03	17.29	6.47	6.31	9.33	6.31	5.07	5.09
Transport equipment	5.30	6.92	12.21	14.60	24.30	29.66	0.74	0.76	0.40	0.28	0.31	0.69
Precision machinery	5.68	13.41	11.12	12.71	12.13	6.38	3.31	4.04	3.25	13.29	5.77	8.56
Petroleum and coal products	0.52	0.13	0.06	0.21	2.09	11.98	27.84	30.59	11.45	11.43	14.03	12.06
Other manufacturing	1.80	2.02	4.34	3.69	3.89	4.46	0.45	0.65	0.69	0.49	0.40	0.52
Commerce	15.05	8.96	13.83	17.75	28.83	26.71	1.33	1.67	1.61	1.47	2.48	2.03
Services	0.22	0.27	0.35	0.90	1.01	1.22	0.02	0.04	0.01	0.09	0.26	0.20
Others	0.55	0.34	0.58	1.36	1.20	1.04	0.04	0.06	0.05	0.13	0.04	0.04

	Employment											
Total	1.84	2.05	1.76	2.30	2.36	2.03	0.25	0.27	0.27	0.28	0.30	0.28
Manufacturing	5.86	6.68	5.80	7.49	7.39	6.61	0.84	0.89	0.92	0.93	0.97	0.96
Food processing	1.56	1.91	1.81	2.03	2.03	1.84	0.27	0.18	0.19	0.22	0.28	0.22
Textiles	7.37	8.34	4.68	7.36	7.61	7.37	0.02	0.01	0.02	0.14	0.16	0.14
Chemicals	11.37	12.26	11.03	14.00	14.86	13.18	6.23	8.41	9.63	9.11	10.51	9.64
Basic metals	10.47	12.31	11.25	9.62	8.48	8.53	0.27	0.77	0.75	0.76	0.97	1.00
General machinery	3.40	3.78	3.15	4.85	3.51	2.67	1.48	0.76	0.68	0.73	0.81	0.50
Electrical machinery	12.68	13.82	11.45	14.86	14.81	13.55	1.84	2.04	2.00	2.19	1.95	2.10
Transport equipment	9.29	11.63	9.48	13.47	14.32	13.30	0.23	0.32	0.38	0.20	0.20	0.33
Precision machinery	5.91	10.63	6.39	8.55	7.82	3.66	1.22	1.34	1.12	1.50	1.98	2.35
Petroleum and coal products	4.75	12.05	0.82	13.29	13.62	2.05	22.88	21.57	20.37	20.40	18.65	19.19
Other manufacturing	2.17	2.20	3.11	3.57	3.43	2.99	0.12	0.14	0.17	0.14	0.11	0.14
Commerce	1.53	1.52	1.16	1.50	1.99	1.34	0.20	0.25	0.23	0.24	0.33	0.25
Services	0.18	0.17	0.22	0.34	0.26	0.32	0.01	0.01	0.01	0.02	0.05	0.04
Others	0.29	0.30	0.28	0.33	0.33	0.30	0.03	0.03	0.02	0.03	0.02	0.01

Data Sources: OLD87/88, 89, 90, 91, 92; AF87/88, 89, 90, 91, 92; EPA94.

Japanese-owned manufacturing firms does not appear to be as extensive as for U.S.-owned firms, but it has been increasing. We again need to discount the figures for 1991 and 1992, however. The share of JAFFs in the activities of all firms in Japan has been low and nearly constant. The asymmetry of inward and outward DFI is also apparent at the sectoral level.

Second, industries of comparative advantage for Japan, such as electrical machinery and transport equipment, have rapidly increased the ratio of value added in FAJFs to that in Japanese-owned firms. In 1992, the ratios were as high as 17.29 and 29.66 percent for electrical machinery and transport equipment. The value-added shares of JAFFs to firms in Japan, in contrast, started from a low level in 1987 and remained low in 1992—for example, 5.09 and 0.69 percent in electrical machinery and transport equipment, respectively. The value-added shares of FAJFs to Japanese-owned firms for general machinery and precision machinery show some anomalies in 1992; in that year, value added by FAJFs in these industries decreased drastically. We are not sure whether this apparent decrease is due to a small, unstable sample, to industry reclassification of firms, or to changes in firms' strategies.

Third, in industries of comparative disadvantage for Japan, such as textiles and chemicals, the shares of FAJFs in Japanese-owned firms have also increased. The share of JAFFs in firms in Japan also increased in the chemical industry up to 1991. Large outward and inward DFI characterizes the chemical industry in the case of the United States, and the Japanese chemical industry seems to behave in the same manner.

2.5 Commercial FAJFs and the Presence of General Trading Companies

A special feature of foreign affiliates of Japanese firms is the large presence of commercial FAJFs in the commercial sector, particularly in the wholesale trade sector. Table 2.6 presents a Japan-U.S. comparison of manufacturing and commercial affiliates in 1991. The table classifies industries both for parent companies and for foreign affiliates. FAJFs in the wholesale trade sector had 75 and 56 percent shares in all FAJFs in terms of sales and value added, while FAUSFs in the wholesale trade sector (excluding petroleum wholesale trade) had shares of 18 and 12 percent.[17] Although the figures for FAUSFs would be larger if the wholesale petroleum trade were included, the figures for FAJFs are still much larger than those for FAUSFs. FAJFs in the wholesale trade sector are also characterized by high value added per employee compared with FAUSFs.

17. It should be noted that FAJFs do not include affiliates (or parent companies) in the finance, insurance, and real estate sectors, while FAUSFs do include affiliates (or parent companies) in the finance (excluding banking), insurance, and real estate sectors. We should also take into account that affiliates in the service sector have a larger share in the case of FAUSFs than in the case of FAJFs.

Table 2.6 Comparison of Manufacturing and Commercial Affiliates: Japan and the United Sta

Industry	Affiliates		Sales		Value Added[a]		Employment		Average Number of Employees	Value-Added Ratio[b] (%)
	Number	%	Millions of Dollars	%	Millions of Dollars	%	Number	%		
							Foreign Affiliates[d] of Japanese Firms (FAJFs)			
							By Parent Companies' Classification			
All industries	2,851	100.00	498,193	100.00	98,105	100.00	919,294	100.00	322	19.69
Manufacturing	2,119	74.32	240,706	48.32	67,213	68.51	741,615	80.67	350	27.92
Wholesale and retail trade	710	24.90	256,964	51.58	30,645	31.24	174,829	19.02	246	11.93
Wholesale	638	22.38	254,658	51.12	30,021	30.60	162,918	17.72	255	11.79
Retail	72	2.53	2,307	0.46	624	0.64	11,911	1.30	165	27.03
							By Affiliates' Classification			
All industries	2,851	100.00	498,193	100.00	98,105	100.00	919,294	100.00	322	19.69
Manufacturing	1,723	60.43	119,880	24.06	42,049	42.86	744,253	80.96	432	35.08
Wholesale and retail	1,112	39.00	377,193	75.71	55,833	56.91	171,098	18.61	154	14.80
Wholesale	1,012	35.50	372,534	74.78	54,795	55.85	154,294	16.78	152	14.71
Retail	100	3.51	4,659	0.94	1,038	1.06	16,804	1.83	168	22.28
							Foreign Affiliates[d] of U.S. Firms (FAUSFs)			
							By Parent Companies' Classification			
All industries	15,710	100.00	1,242,635	100.00	335,963	100.00	5,386,500	100.00	343	27.04
Manufacturing	10,720	68.24	982,139	79.04	n.a.	n.a.	3,945,600	73.25	368	n.a.
Manufacturing (excl. petro. and coal prod.)	10,689	68.04	784,872	63.16	n.a.	n.a.	3,778,700	70.15	354	n.a.
Wholesale and retail trade	1,041	6.63	127,437	10.26	n.a.	n.a.	519,000	9.64	499	n.a.

(*continued*)

Table 2.6 (continued)

Industry	Affiliates		Sales		Value Added[a]		Employment		Average Number of Employees	Value-Added Ratio[b] (%)	Value-Added Productivity[c] ($)	By-Destination Shares in Sales (%)			By-Origin Shares in Purchases (%)	
	Number	%	Millions of Dollars	%	Millions of Dollars	%	Number	%				Local	Japan/US	Third Countries	Local	Imports
Wholesale	871	5.54	102,057	8.21	n.a.	n.a.	180,100	3.34	207	n.a.	n.a.	52.41	11.03	36.56	n.a.	n.a.
Wholesale (excl. petro. wholesale)	750	4.77	79,613	6.41	n.a.	n.a.	168,400	3.13	225	n.a.	n.a.	45.78	12.27	41.95	n.a.	n.a.
Retail	170	1.08	25,380	2.04	n.a.	n.a.	338,900	6.29	1,994	n.a.	n.a.	91.58	7.42	0.99	n.a.	n.a.
By Affiliates' Classification																
All industries	15,710	100.00	1,242,635	100.00	335,963	100.00	5,386,500	100.00	343	27.04	62,371	66.35	10.10	23.55	n.a.	n.a.
Manufacturing	6,459	41.11	680,525	54.76	n.a.	n.a.	3,355,400	62.29	519	n.a.	n.a.	62.90	10.98	26.12	n.a.	n.a.
Manufacturing (excl. petro. and coal prod.)	6,390	40.67	596,257	47.98	182,082	54.20	3,299,600	61.26	516	30.54	55,183	59.86	11.99	28.15	n.a.	n.a.
Wholesale and retail trade	4,339	27.62	367,216	29.55	n.a.	n.a.	1,040,100	19.31	240	n.a.	n.a.	70.78	6.50	22.72	n.a.	n.a.
Wholesale	4,121	26.23	327,559	26.36	n.a.	n.a.	554,800	10.30	135	n.a.	n.a.	67.55	7.27	25.18	n.a.	n.a.
Wholesale (excl. petro. wholesale)	3,807	24.23	227,069	18.27	40,832	12.15	520,500	9.66	137	17.98	78,448	70.22	4.53	25.26	n.a.	n.a.
Retail	218	1.39	39,657	3.19	n.a.	n.a.	485,300	9.01	2,226	n.a.	n.a.	97.39	0.21	2.40	n.a.	n.a.

Data Sources: NEW91; FAUSF91 (tables III.A.2, E.8, F.3, F.9, G.4, G.11); Mataloni (1994, 61).

[a]Value added: for Japan, sales minus purchases; for the United States, gross product in Mataloni (1994, 61).

[b]Value-added ratio: value added/sales.

[c]Value-added productivity: value added/employment.

[d]Foreign affiliates: for Japan, see notes to table 2.1; for the United States, see chap. 1 in this volume.

Table 2.7 **Sales and Purchases by Major Foreign Branches of Japanese General Trading Companies and Commercial FAJFs, 1987 Financial Year**

Transaction	GTC Branches[a] (a)	Commercial FAJFs[b] (b)	Total FAJFs[b] (c)	(a)/(b)*100 (d)	(b)/(c)*100 (e)
Total sales	23,482,200	39,876,831	54,808,975	58.89	72.76
To local	8,209,900	24,796,290	36,219,960	33.11	68.46
To Japan	7,631,200	7,825,381	9,294,170	97.52	84.20
To third countries	7,641,200	7,255,160	9,294,845	105.32	78.06
Total purchases	n.a.	31,914,173	42,135,754	n.a.	75.74
From local	n.a.	9,637,230	14,535,836	n.a.	66.30
From Japan	n.a.	16,063,493	20,571,156	n.a.	78.09
From third countries	n.a.	6,213,450	7,028,762	n.a.	88.40

Data Sources: GTC; OLD87/88.

Note: Cols. (a), (b), and (c) are in millions of yen; cols. (d) and (e) are in percent.

[a]Data are for major foreign branches of nine Japanese general trading companies, which include 197 affiliates in 37 countries. GTC branch data, originally in U.S. dollars, are converted by IMF92 (437): $1 = 144.64 yen.

[b]By-destination sales by commercial FAJFs and total FAJFs are estimated using sectoral by-destination ratios. See the text for details.

Table 2.6 also shows an interesting contrast between figures based on the industry classification of parent companies and those based on the classification of affiliates. In the case of FAUSFs, we see that most FAUSFs in the wholesale trade sector have parent companies in non-wholesale-trade sectors. This means that a major function of wholesale FAUSFs is undertaking foreign marketing operations for manufacturing parent companies. In contrast, in the case of FAJFs, about half of FAJFs in the wholesale trade sector have parent companies in the wholesale trade sector. This suggests that general trading companies (GTCs) play a large role in Japanese international transactions.

A special study conducted by the Japan Foreign Trade Council presents data for sales by the "major branches" of the nine largest Japanese GTCs.[18] The "major branches" are defined as foreign affiliates of GTCs that have close contacts with the Japanese headquarters and organize local activities. The sample covered 197 affiliates in 37 countries. Table 2.7 presents the sales figures. Although we have some reservations about the quality of these data, particularly because of double counting of transactions among the firms, the significance of GTC activities is apparent. Sales to Japan by GTC major branches have a 98 percent share in those by commercial FAJFs in our estimates. The same share in terms of the sales to third countries is 105 percent. These shares are, of course, subject to estimation error, but they clearly indicate that the presence of GTCs in international transactions of commercial FAJFs is large.

18. The nine largest Japanese GTCs are C. Itoh, Mitsui, Sumitomo, Marubeni, Mitsubishi, Nissho Iwai, Tomen, Nichimen, and Kanematsu Gosho. The study by the Japan Foreign Trade Council covers only the financial years 1983 and 1987.

2.6 Concluding Remarks

In this paper, we applied our nationality-based net sales and value-added framework to Japanese data. Foreign production activities of Japanese firms have become increasingly important, and the nationality-based net sales estimates proved to be useful in analyzing firms' international activities. Our value-added accounting also provides an integrated framework for analyzing both exports and activities of foreign affiliates and thereby for understanding key characteristics of the Japanese economy.

We found that Japan is special in the following four ways. First, Japanese-owned firms have become increasingly dependent on the marketing activities of their foreign affiliates, rather than depending on cross-border exports by parent firms located in Japan. Second, the asymmetry between inward and outward DFI is apparent in terms of sales, value added, and employment, at both the macroeconomic and sectoral levels. Third, Japanese net sales to foreigners are consistently larger than the cross-border net exports of Japan. Fourth, among the activities of FAJFs, the importance of commercial FAJFs is particularly large, with these commercial affiliates handling a large portion of Japanese exports and imports. Our statistical framework is useful for identifying these characteristics.

To apply our analytical framework more rigorously, a number of statistical improvements are required. First, MITI or the government of Japan must develop an enforceable data collection system for both inward and outward DFI on a proper legal basis. This statistical reform should increase the coverage of the surveys as well as improve the quality of the information requested on the questionnaires, particularly that on by-destination sales and by-origin purchases of affiliates. In this regard, the introduction of the new FAJF series has been a major step by MITI in improving data collection. We hope that more questions on foreign affiliates will be included in the survey and that the survey will be integrated with the old FAJF series. Second, the extended surveys of the old FAJF series implemented once every three years report ratios of "within the same firm group" sales and purchases to total sales and purchases, but no data on sales among FAJFs or among JAFFs are collected, as U.S. BEA surveys do. Adding questions on sales among affiliates will help us apply our method more precisely. Third, we need to develop a proper statistical framework to capture the activities of commercial FAJFs. Possible double counting in sales to or purchases from Japan or third countries by FAJFs must be corrected. In addition, possible double counting coming from the definition of FAJFs must be eliminated.

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Comment

Michael G. Plummer

Like its U.S. companion piece, this chapter takes a nationality-based accounting approach to international transactions, using the new technique to calculate, inter alia, net sales by Japanese to foreigners, value added by foreign affiliates of Japanese firms (FAJFs), and value added by Japanese affiliates of foreign firms (JAFFs), in the aggregate and by sector. By concentrating on the nationality of firms rather than on their location (as is traditionally done), the authors are able to give a more accurate picture of the evolving competitiveness and characteristics of Japanese firms, providing new insights into a number of old questions.

This approach has many exciting applications, particularly for the private sector and policy circles. For example, Ford Motor Company recently launched its Ford 2000 strategy, which involves a major reorganization of its domestic and international operations to develop a truly global company. Moreover, its competitors are embracing variations of the same corporate strategy. This globalization of the automobile industry underscores the increasing irrelevance of geography-based accounting to formulate implicit proxies of competitiveness in a critical sector. Clearly, nationality-based accounting creates a far more accurate picture of the international competitiveness of American and Japanese firms.

Unfortunately, from a policy perspective, the results of Kimura and Baldwin end up reinforcing a number of accepted stereotypes about Japan and its firms that have generated repeated trade disputes, threats of retaliation against Japan, and the recurrent possibility of trade war. I would like to outline below a few of the more salient policy issues that relate to the paper, in anticipation of erroneous interpretation of the results. In citing numbers between the Japanese and U.S. papers, I ignore the important differences and shortcomings in data collection. After all, such imperfections will generally be ignored by policy-

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makers in discussing the issues, an inevitable and heavy burden that applied economists must shoulder, albeit with regrets.

First, net sales of Japanese firms to foreigners are not only positive but huge, growing from $139 billion (U.S. dollars) in 1987 to $377 billion in 1992, far exceeding and growing more rapidly than the usually cited Japanese (cross-border) merchandise trade balance ($80 and $106 billion, respectively). This compares to a $72 billion *deficit* and $61 billion surplus in the case of net sales by Americans to foreigners in 1987 and 1991 (corresponding to deficits in the cross-border merchandise trade balance of $160 and $74 billion, respectively) found in the U.S. companion paper. These results reinforce the view of Japan as the quintessential mercantilist; it could be argued that not only is Japan a closed market at home but Japanese firms tend only to "buy Japanese."

Second, a related issue is that of the asymmetry between Japanese inward and outward direct foreign investment. The share of foreign affiliates in Japanese economic activity is far smaller than that of Japanese affiliates abroad, as well as compared to other developed countries. For example, in 1991, in terms of value added, JAFFs accounted for only 1.1 percent of manufacturing value added by Japanese firms, whereas the comparable figure for FAJFs was 8.6 percent and for foreign affiliates in the United States 13.3 percent. A number of critics have stressed that the intractable trade and other commercially oriented imbalances of Japan are related to direct and indirect restrictions on inward direct foreign investment; they will, perhaps, find more ammunition from the nationality-based approach.

Finally, at the sectoral level, the role of Japan as a "strategic" protectionist could also be supported through a selective interpretation of the data. For example, JAFFs have a relatively large share of total sales of Japanese firms in areas where Japan is thought to have a comparative disadvantage (with the exception of textiles). But "strategic" sectors like electrical machinery and transport equipment show huge discrepancies: JAFFs as a percentage of total Japanese sales grew from only 4 percent to 4.4 percent from 1987 to 1992 in the former and actually fell from an extremely low 0.59 percent to 0.55 percent over the same period in the latter. For the same years and sectors, these figures compare to rises from 11 to 13 percent and from 9 to 16 percent for FAJFs. Expect these discrepancies to get worse with any increases in the value of the yen and trade frictions.

While some of these numbers seem to provide ample grist for the Japan-bashing mill, it is important to keep in mind a number of caveats in interpreting them. My intent here is not to be an apologist but rather to try to ensure that the results are understood in the spirit in which they were derived: as an important step toward the development of a nationality-based accounting system rather than as a new weapon of (trade) war.

First, aside from the obvious differences in the surveys being used between the U.S. and Japanese papers and, in particular, the biases inherent in the MITI

survey, nationality-based accounting in these papers is applied to only two countries, and hence, we have an important identification problem: who is the outlier? In fact, the authors—one Japanese, one American—perhaps "suffer" from having (intellectual and locational) comparative advantages in each of these two countries, which happen to be at the forefront of economic confrontation in the global economy. If instead we were comparing, say, Germany, Korea, the United States, and Japan, who would be the outlier? Who would be the "mercantilist"? This problem underscores the importance of expanding the country coverage.

Second, as is noted in part in the U.S. paper, the activities of FAJFs have been affected by the international commercial policy environment. Trade frictions between Japan and its most important trading partners in the developed world have led, perhaps, to a "premature" globalization of Japanese industry in order to reduce geography-based bilateral trade discrepancies. Any tendency for FAJFs to buy from Japanese suppliers would, therefore, be logical: the preference is to produce in Japan, so when they are "pushed" offshore, they include as much Japanese value added as possible. Interestingly, what might seem to be antimarket policies leading to lower geography-based imbalances could actually lead to lower nationality-based imbalances. As FAJFs become more accustomed to the foreign environment, local sourcing will naturally increase, thereby reducing net sales by the Japanese to foreigners.

Third, we are limited to four years in these studies and, hence, are not able to get a historical perspective on the issues. As is well known, relatively large increases in U.S. direct foreign investment began after World War II, whereas the upsurge in Japanese direct foreign investment is far more recent. In order to confirm that Japan is "special," we would have to know what the United States (and preferably other countries) was like at a similar phase of structural adjustment. Now, this is not to say that the authors should therefore extend their analysis back 50 years—though this would be nice!—as data limitations would preclude such an extension.

Although it is important to be careful in interpreting the results of Kimura and Baldwin, it is clear that their approach effectively complements the existing balance-of-payments approach. Moreover, it holds considerable potential in rendering global computational general equilibrium models and derived measures of national sectoral competitiveness more realistic. In short, I am convinced that the Kimura and Baldwin approach is a seminal contribution to the literature.